



# Low Carbon Blending

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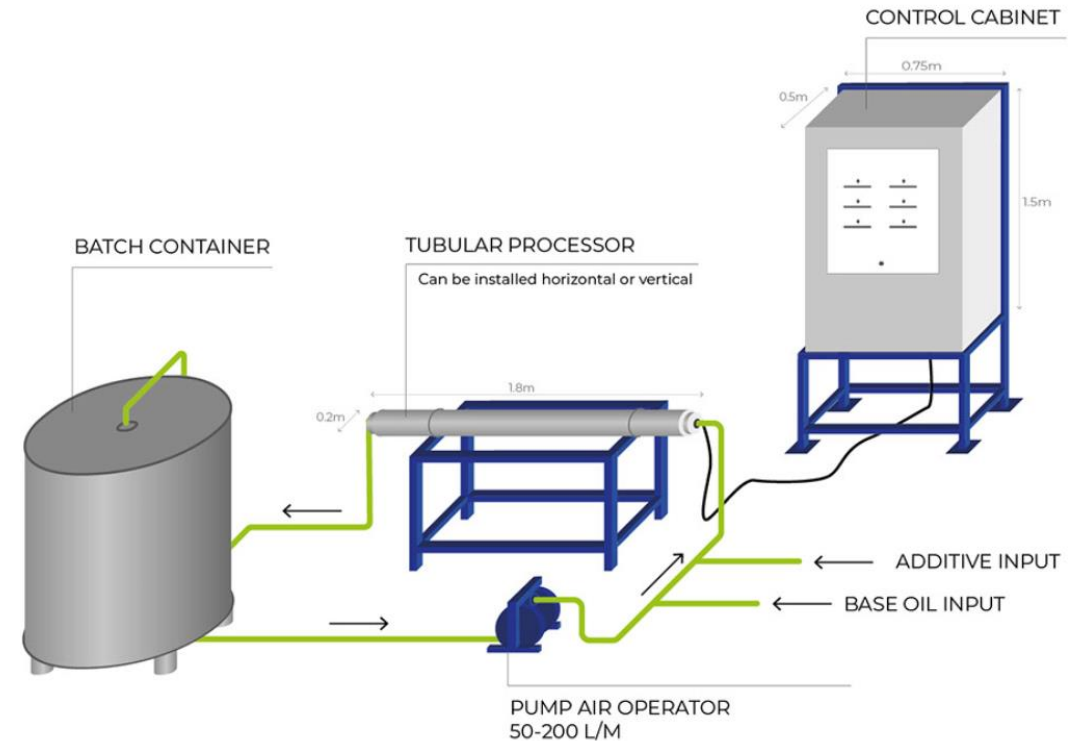


# What Is It?

- Heatless process
  - Known as 'cold boiling'
- Lacks physical agitation
- Blends on a molecular level
- Low energy requirements
- Improved speed of blending
- Flexible manufacturing
  - No wasted heat or resources if plans change
- Can move towards or beyond carbon neutral

# How Does It Work?

- Uses transducers to generate ultrasonic cavitations
  - Can blend at ambient
  - 2.1 million cycles per second
- Generators require 7.5 or 15 amps to operate
  - 1.5kw or 3kw processor
  - Only electrical energy needed
- Seen 10MT produced with 8kw/h total energy
- QC adjustments at ambient
- Low MBQ
  - 603kgs 10w-50 PCMO achieved in IBC



# How Does It Work?



# Growing Focus on Sustainability

- Industry trends
  - Led by legislation and market demand
- Existing sustainability focusses
  - RMs
  - Logistics
  - Packaging
  - ISO 14001
  - Company sustainability statements
  - Carbon capture/offsetting
- Further opportunities for improvement in manufacturing processes
  - Low energy usage
  - Ambient base oils
  - Ambient blend vessels

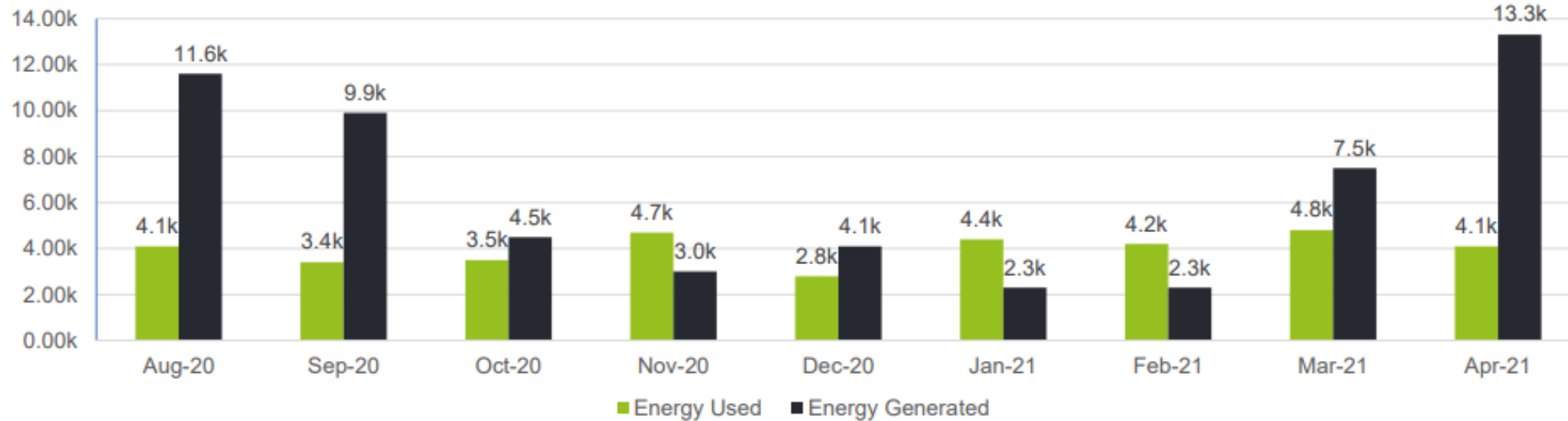


# Impact on Carbon Footprint

- Up to 90% reduction in gas usage
- Quick blending = idle equipment
- Less energy required per MT manufactured
  - 10MT needs approx. 8kWh
  - Previously ~1962kWh
- Can help achieve carbon neutral blending
  - Evidenced by energy audit
- Lack of heat = less chance of damaging blend
  - Lowers chance of waste
- Low minimum blend volumes
  - JIT for slow moving/low volume lines = less potential waste
- Equipment is recyclable



## Energy Used and Energy Generated by Month Year



**58,473**

Energy Generated

**kWh**

**36,082**

Energy Used

**kWh**

**22,391**

Difference

**kWh**



*\*Data anonymised and permission provided by user to share*

# Blend Times

Batch Number	Product Type	Manufactured KG	QC Status	Time
BO00121228	SAE 40	2000	Passed	0:26:00
BO00121308	HDDO 10W30	5148	Passed	0:29:00
BO00121424	STOU	11564	Passed	0:29:00
BO00119661	HDDO 10W-40	10770	Passed	0:31:00
BO00119955	HDDO 15W-40	7000	Passed	0:31:00
BO00120793	HM Hydraulic Fluid	7000	Passed	0:31:00
BO00121769	HVI Hydraulic Fluid	12064	Passed	0:33:00
BO00121748	PCMO 5W-30	3700	Passed	0:33:00
BO00120184	UTTO	10441	Passed	0:33:00
BO00122077	STOU	12200	Passed	0:34:00
BO00120792	HM Hydraulic Fluid	4500	Passed	0:38:00
BO00119925	HM Hydraulic Fluid	7000	Passed	0:39:00
BO00121437	PCMO 10W-50	603	Passed	0:39:00
BO00121301	STOU	7118	Passed	0:40:00
BO00120066	TO-4 SAE 30	3348	Passed	0:42:00
BO00121466	Chain Oil	7000	Passed	0:44:00
BO00120026	STOU	7175	Passed	0:45:00
BO00121866	HM Hydraulic Fluid	7000	Passed	0:46:00



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# Summary

- Reduces GHGs and emissions
  - Via lower fossil fuel requirements
- Average UK house requires 250kWh per month
  - Energy surplus = 7.5 years of demand
  - Highlights significant energy saving
- Carbon neutral blending can be a reality
- Sites can become more self sustaining
- Compatibility with renewable energies
  - Eg solar or wind
  - Less drain on national power grid
  - Reduces dependence on gas/diesel
- Lowers kWh per MT



**Thank you**

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